

## PATENT SPECIFICATION



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## COMPLETE SPECIFICATION

## Improvements in Wearing Apparel

We, CHARLES GODFREY EDWARDS, formerly of 8, Falkland Drive, Onchan, Isle of Man, now of OT.JX 270,137, of 6, E.C., Royal Naval Barracks, Chatham, Kent, and SAVAS CONSTANTINE DIMITRIOU, formerly of Thurlow Towers, Knollys Road, Streatham, London, S.W.16, now of 51, Ralph Court, Bayswater, London, W.2, both British Subjects, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention relates to a garment which, while suitable for wear with comfort under normal conditions, is also provided with a plurality of air-tight compartments adapted to be inflated through non-return valves so as to give buoyancy to the wearer in case of immersion in water, thus forming a life-saving device.

An object of this invention is to provide such an inflatable garment which is easily convertible from its normal to its buoyant condition, which is capable of remaining buoyant even if damaged, and which can be readily deflated, for example after inflation for testing.

Another object is to provide such a garment which will support the wearer in water in such a manner that his face is normally kept out of the water, even if he is injured or unconscious.

A further object is to provide such a garment which affords ample protection against weather when in normal use.

The improved garment is particularly well adapted for the use of seamen, airmen and other men of the services, and as its construction is such as to offer little or no inconvenience to the wearer, it may serve as a garment for wear under conditions where its life-saving qualities are not likely to be called upon.

According to this invention, the improved garment includes a plurality of isolated air-tight compartments adapted to be inflated, a common duct communicating with said compartments for admitting inflating gas, a plurality of non-return valves disposed respectively

in branches leading from said duct to individual compartments or groups of compartments and so arranged as to prevent the return flow of gas from a compartment to said duct, and controllable exhaust means for permitting the escape of gas from said compartments for the purpose of deflating the garment, said exhaust means being so arranged as to prevent the exhaust of gas from one compartment or group of compartments to another compartment or group of compartments; preferably the individual compartments or groups of compartments are provided respectively with separate exhaust passages each having its own closure member.

The improved garment preferably has said compartments on the front of the body portion, whereby the wearer is caused to float chest upwards when afloat in the garment, and in a collar portion of the garment, whereby the head of the wearer is supported so as to keep his face out of the water.

In one form the improved garment is a substantially waterproof one-piece garment adapted to envelop the wearer at least from the ankles to the neck; it includes separated leg coverings; and an opening is provided in the body portion at one side of the front thereof, extending from the neck downwards, to permit entry of the wearer, this opening being closed by a sliding-clasp fastening associated with folding sealing means.

These and other features of the invention will be described with reference to the embodiments shown by way of example in the accompanying drawings, in which:—

Fig. 1 shows one form of the improved garment, in normal use,

Fig. 2 is a front view of a portion of the same garment, with a part broken away,

Fig. 3 is a section on the line 3—3 in Fig. 1,

Fig. 4 is a front view of another portion of the same garment, and

Figs. 5 and 6 are respectively front and back views of another form of the improved garment.

The one-piece garment shown in Fig. 1 is adapted to envelop the wearer from the ankles to the neck, and it includes legs 10, a body portion 11 and sleeves 12, all consisting of rubberised or close-woven or other water-proof or partly water-proof fabric.

An opening is provided in the body portion 11, extending from the neck downwards at one side of the front, to permit entry of the wearer, this opening being closed by a sliding clasp-fastening 13.

The garment is provided at the front 15 of the body portion with a plurality of isolated air-tight compartments adapted to be inflated to impart the required buoyancy. In this example there are four such compartments 14, formed by patches 15 of fabric secured at their borders to the front of the body portion.

A common duct for inflating the compartments 14 is constituted by a rubber tube 16 having a free length 16A at one end terminating in a mouthpiece 17, which preferably incorporates a screw-down stop valve. The mouthpiece is normally lodged in a pocket 18 on the garment. The tube 16 extends downwards along the middle of the front of the garment within a casing consisting of two strips 19 of rubberised fabric (Figs. 2 and 3) vulcanized around the tube so as to form two opposed flanges by which it is secured to the garment. As shown in Fig. 3, the flanges are sealed between the borders of the patches 15 and the front of the body portion which forms the inner sides of the compartments.

A separate branch pipe 21 leads from the common pipe 16 to each buoyancy compartment 14, terminating in a non-return valve 22 of the rubber spearhead type. These valves operate to isolate the compartments from one another, so that a leakage from one is without effect on the others.

The compartments 14 are now provided with individual air release valves 23 of the screw-down type.

Closure at the wrists, ankles and neck adapted to resist the entry of water is effected by wrist-bands 24, ankle-bands 25 and a collar-band 26, these bands being made of an elastic fabric comprising a combination of elastic and non-elastic threads and coated or impregnated with a flexible waterproofing composition.

For the purpose of sealing the sliding clasp fastening 13 in an emergency, a suitable length of adhesive tape is provided in a roll 27 (Fig. 4) the outer end 13 are preferably provided with a surface of which is permanently secured to the

front of the body portion of the garment below the opening. Parts of the front of the body portion bordering the fastening face 28 prepared to co-operate with the adhesive tape 27 to form a strong watertight bond, these surfaces 28 being normally covered with protecting tapes 29. The roll 27 is likewise normally covered with a protective casing (not shown) capable of being ripped off in an emergency.

A half belt 30 is provided to take up slack at the waist.

Preferably this garment is provided with an inflatable collar, arranged as hereinafter described with reference to Figs. 5 and 6, and, if desired, additional inflatable compartments may be provided on the front of the upper portion of the legs.

Watertight closure at the lower end of the legs may be achieved by the use of rubber foot coverings connected in a watertight manner with, for example permanently attached to, the legs. Similarly, rubber gloves may be similarly connected to the sleeves.

This garment may be used in combination with a separate helmet of "Balaclava" shape (not shown) having an elastic neck portion adapted to fit over the collar band 26 and provided with fastening means, such as snap fastening elements adapted to engage corresponding fastening elements provided on the garment.

The garment and, if desired, the helmet may be wholly or partially lined with fleecy wool or the like heat retaining material, and pockets of the external patch type may be provided at convenient points on the outside of the garment.

Under normal conditions of wear the garment is kept wholly or partly deflated so as to offer a minimum of inconvenience to the wearer. Inflation can be effected readily when the emergency conditions involving the possibility of immersion in water appear likely to arise.

Figs. 5 and 6 show an alternative design of the improved garment, in the form of a backless and sleeveless jacket having a portion 11A adapted to cover the front of the body of the wearer. This portion is provided with inflatable compartments 14 arranged similarly to those shown in Fig. 1, and having a similar arrangement of inflating duct 16, non-return valves 22 and air-release valves 23. Adjustable braces 30 lead from the portion 11A in such a way as to pass over the shoulders of the wearer and terminate in a common loop 31 through which is threaded a waist-belt 32 attached near one end at 33 to the portion 11A

and having its other end running through a loop 34 on the portion 11A.

This garment includes a collar 35 which is shaped to provide an aperture 5 36 normally capable of allowing the passage of the wearer's head. The collar is provided with an inflatable compartment 14A supplied with air through a branch 21A from the pipe 16 and 10 through a non-return valve 22, this compartment having an air-release valve 23. The collar is so shaped that, when the compartment 14A is inflated, the collar will support the back of the head of the 15 wearer when afloat in the garment.

The improved garment may be provided with a small container of gas under pressure for inflating the compartments, instead of the mouthpiece.

20 If any of the buoyancy compartments develops a leak while the improved garment is supporting the wearer in water, the non-return valves associated with the other compartments prevent the loss of 25 their gas content through the leaky compartment. Should one of the compartments become punctured before the garment is inflated, the wearer can ensure the inflation of the undamaged compartments by applying digital pressure to the 30 stem of the valve 22 that opens into the punctured compartment and thereby preventing waste of inflation air.

35 Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

40 1. A garment adapted to give buoyancy to the wearer in case of immersion in water, including a plurality of isolated air-tight compartments adapted to be inflated, a common duct communicating with said compartments for admitting 45 inflating gas, a plurality of non-return valves disposed respectively in branches leading from said duct to individual compartments or groups of compartments and so arranged as to prevent the return flow 50 of gas from a compartment to said duct, and controllable exhaust means for permitting the escape of gas from said compartments for the purpose of deflating the garment, said exhaust means being so 55 arranged as to prevent the exhaust of gas from one compartment or group of compartments to another compartment or compartments.

60 2. A garment as claimed in claim 1, wherein said individual compartments or groups of compartments are provided respectively with separate exhaust

passages each having its own closure member.

3. A garment as claimed in claim 1 or 2, and having said compartments on the front of the body portion, whereby the 65 wearer is caused to float chest upwards when afloat in the garment, and in a collar portion of the garment whereby the 70 head of the wearer is supported so as to keep his face out of the water.

4. A substantially waterproof one-piece garment as claimed in claim 1, 2 or 3, 75 adapted to envelop the wearer at least from the ankles to the neck and including separated leg coverings, wherein an opening is provided in the body portion at one side of the front thereof, extending from the neck downwards, to permit 80 entry of the wearer, this opening being closed by a sliding-clasp fastening associated with folding sealing means.

5. A garment as claimed in claim 4, 85 wherein said sealing means are constituted by an adhesive tape normally attached to the garment in a rolled condition and adapted to be stuck by its borders to the parts of the garment 90 bordering said fastening.

6. A garment as claimed in claim 5, wherein said parts to which the adhesive 95 tape is adapted to be stuck have a surface prepared to co-operate with the adhesive tape and are normally covered with protecting tapes.

7. A garment as claimed in any of claims 4 to 6, wherein water-proof boots or gloves or both are connected in a 100 watertight manner to the legs or sleeves of the garment.

8. A garment as claimed in any of claims 4 to 7, wherein water-resisting closure at the neck or wrists or ankles of 105 the wearer is achieved by elastic bands provided on the garment and composed of a fabric comprising a combination of elastic and non-elastic threads and coated or impregnated with a flexible water- 110 proofing composition.

9. A garment as claimed in claim 3, in the form of a backless and sleeveless jacket having a belt and braces adapted to tie the collar or shoulder portions to 115 the back of the belt.

10. The improved garments substantially as herein described or as shown in the accompanying drawings.

Dated this 30th day of January, 1942.

REDDIE & GROSE,  
Agents for the Applicants.  
6, Bream's Buildings,  
London, E.C.4.

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

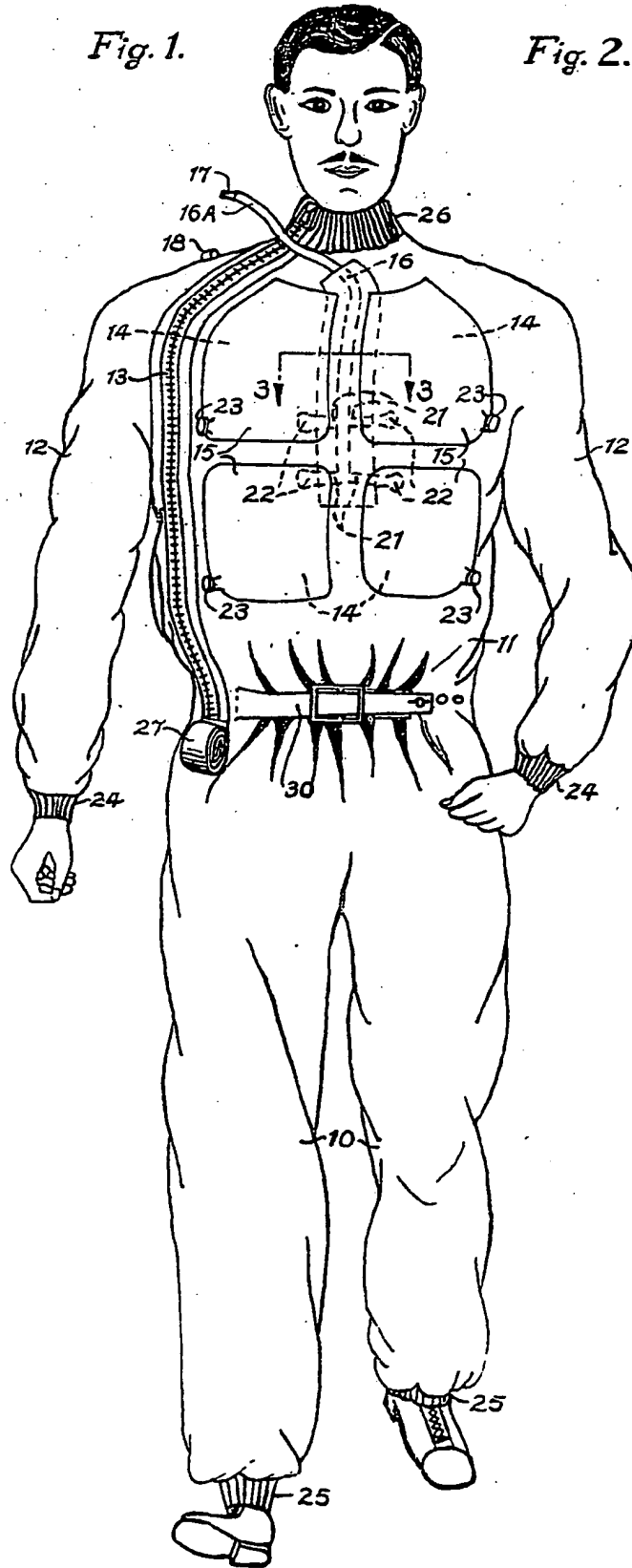


Fig. 2.

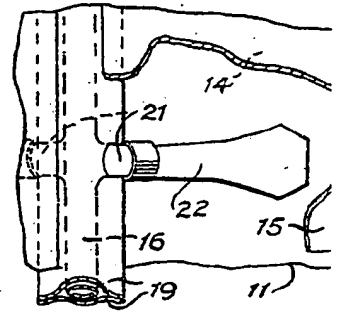


Fig. 3.

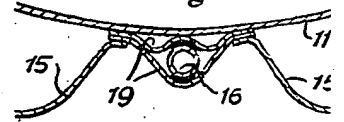
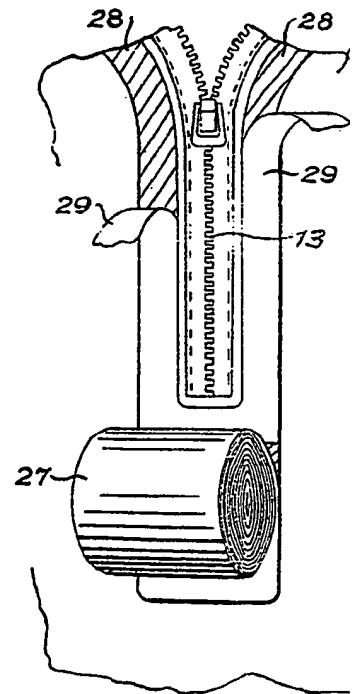


Fig. 4.



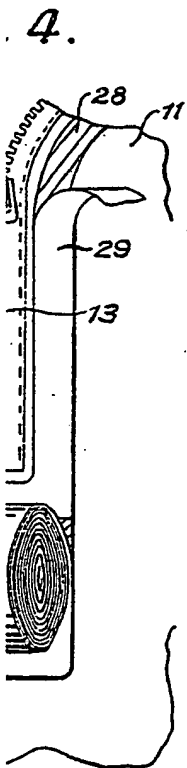
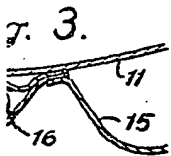
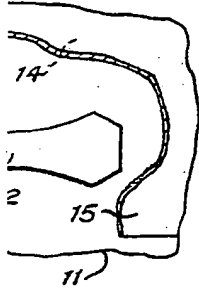


Fig. 5.

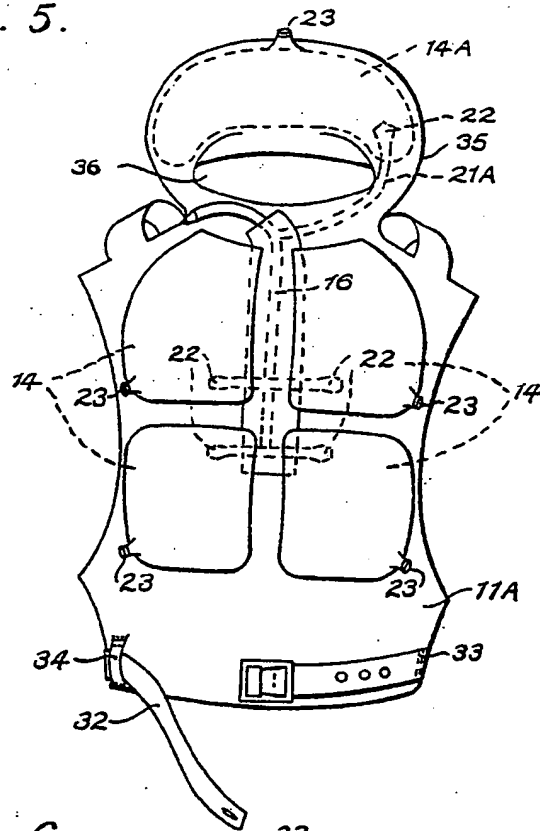
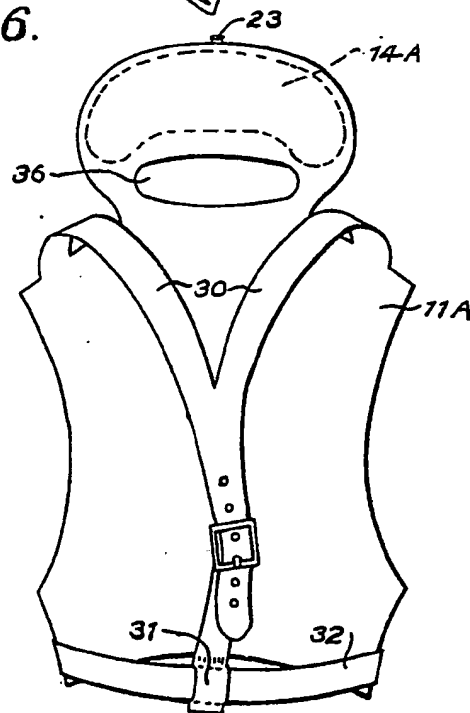


Fig. 6.



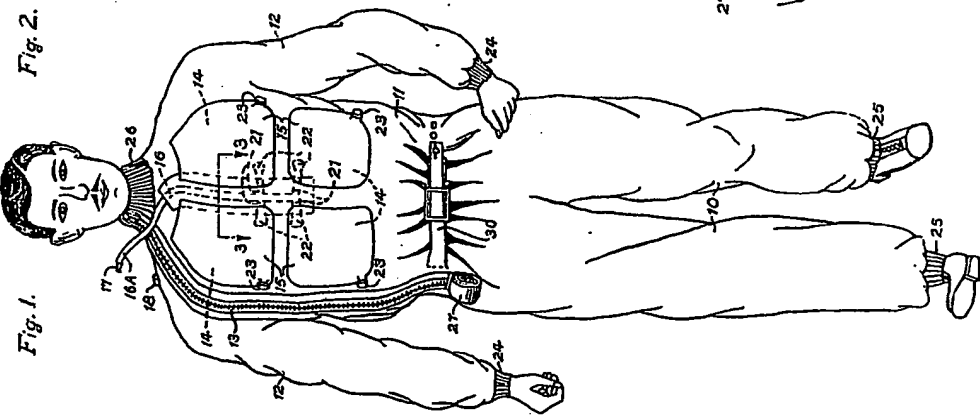


Fig. 1.

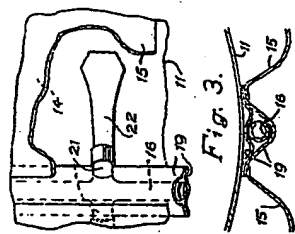


Fig. 2.



Fig. 3.

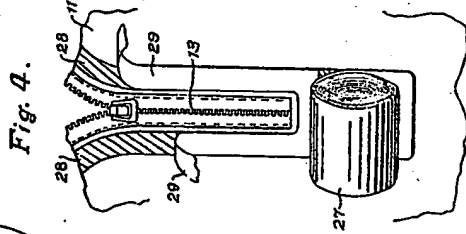


Fig. 4.

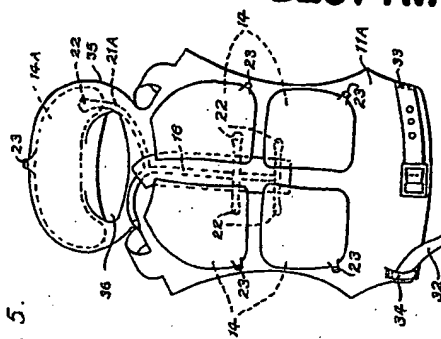


Fig. 5.

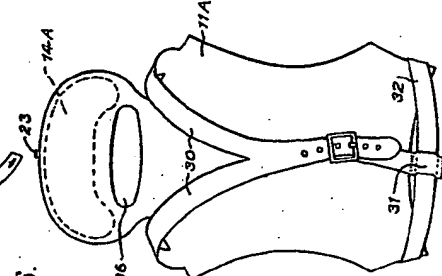


Fig. 6.

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